6. Operation: Front Panel

The standard D Version front panel, shown in Fig. 6.1, offers front panel provides a digital display with rotary front panel input, isolated 37-pin analog/digital I/O, and a RS232 computer interface. In addition, the D Version front panel provides digital 10-key entry, auto-sequencing with memory capability, and modulation for non-linear power profile emulation. The C Version front panel, shown in Fig. 6.2, is blank, providing on a switch to enable control power. For the C Version front pnael, all control must be performed by the provided isolated 37-pin analog/digital I/O or through a computer interface.

A numbered list corresponding to the indicators on the front panels is located below the front panel figures.

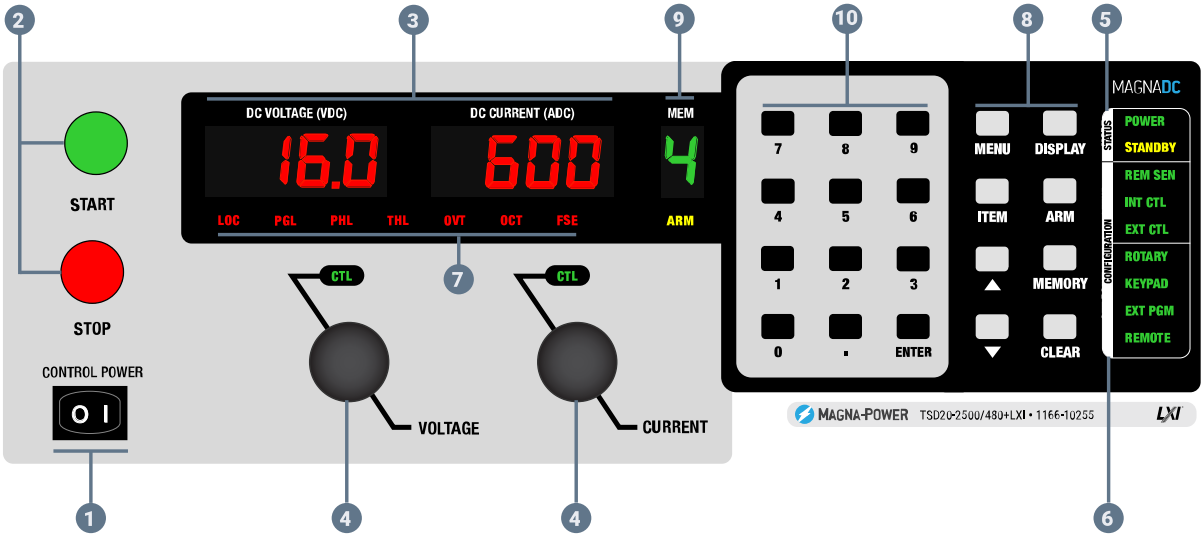

Fig. 6.1 Standard D Version TS Series front panel

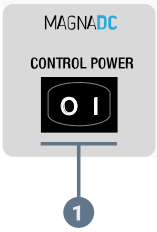

Fig. 6.2 Blank C Version TS Series front panel

1. **Control Power Switch.** Power switch energizes control circuits without engaging main power.
2. **Start and Stop Buttons.** Engages and disengages main power via integrated mechanical contactor.
3. **Voltage and Current Displays.** Meters display output voltage, output current, voltage set point, current set point, over voltage trip and over current trip.
4. **Voltage and Current Knobs.** Stepless rotary knob to set voltage and current.
5. **Status Indicators**
    - **POWER:** Indicates power output
    - **STANDBY:** Indicates control power only

6. **Configuration Indicators**
    - **REM SEN:** Remote sense enabled. See Remote Sense Connection for more information.
    - **INT CTL:** Front panel start/stop/clear enabled
    - **EXT CTL:** External start/stop/clear enabled
    - **ROTARY:** Front panel rotary knob input
    - **KEYPAD:** 10-digit keypad control is enabled
    - **EXT PGM:** External analog voltage-current control
    - **REMOTE:** Computer control

7. **Diagnostic Alarms**
    - **LOC:** Interlock
    - **PGL:** External input voltage beyond limits
    - **PHL:** Indicates input AC phase loss
    - **THL:** Over-temperature condition
    - **OVT:** Over-voltage protection has tripped
    - **OCT:** Over-current protection has tripped
    - **FSE:** Indicates a fuse has cleared

8. **Function Keys.**
    - **MENU:** Selects function
    - **ITEM:** Selects item within function
    - **DISPLAY:** Displays voltage and current set points. Also functions as the up arrow.
    - **TRIP DIS:** Displays OVT and OCT set points Also functions as the down arrow.
    - **CLEAR:** Clears settings or resets fault
    - **ENTER:** Select item
    - **MEM:** Sets the memory location for auto-sequencing

By factory deafult, the TS Series MagnaDC power supply is configured for local sensing, rotary control, internal programming, and voltage input as specified on the rear serial label. TS Series power supplies with the C Version front panel cannot be controlled through the front panel other than engaging the control power using the black rocker switch. While in ROTARY configuration, the front panel voltage and current controls set the boundary limits for output voltage and current, respectively. The following sections describe how to use all of the front panel features. Front panel commands are broken into four groups: run mode commands, set point commands, configuration commands, and calibration commands.

6.1. Setting Set Points

6.1.1. Voltage

When in KEYPAD mode, the voltage set point can be programmed using the numeric keypad or up/down arrows.

MENU Button ‣ Keypad to enter number, Up Arrow to raise, Down Arrow to lower, ENTER Button to save

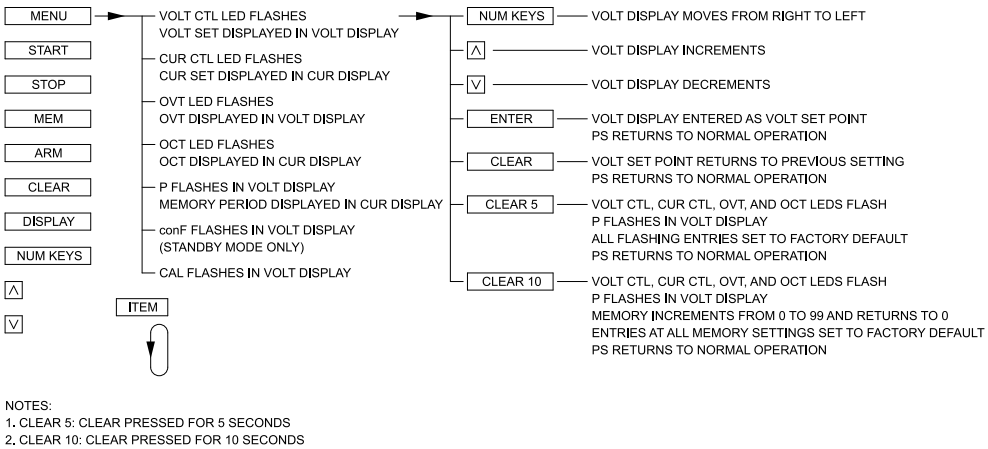

Fig. 6.3 Set the voltage set point from the front panel in KEYPAD mode

6.1.2. Current

When in KEYPAD mode, the current set point can be programmed using the numeric keypad or up/down arrows.

MENU Button ‣ ITEM Button ‣ Keypad to enter number, Up Arrow to raise, Down Arrow to lower, ENTER Button to save

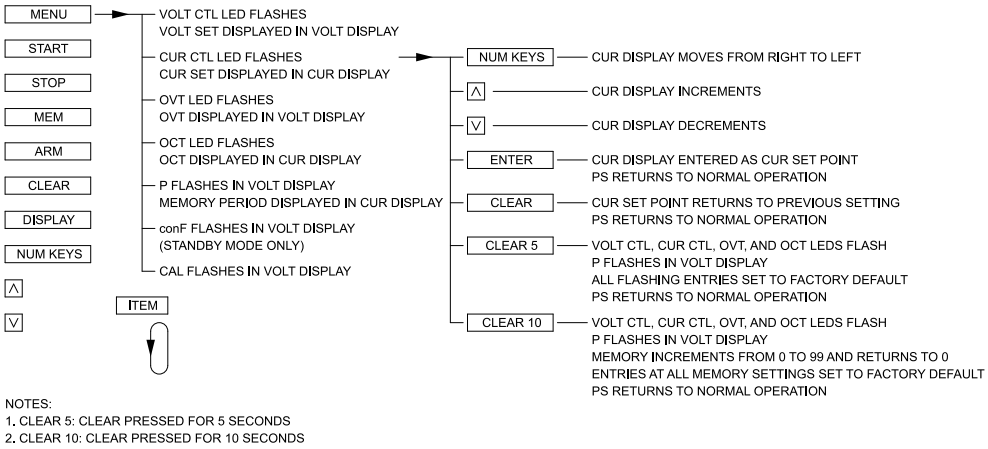

Fig. 6.4 Set the current set point from the front panel in KEYPAD mode

6.1.3. Period

When in KEYPAD mode, program the period (seconds), which is the time interval for the present voltage and current set points, when using the auto-sequencing functionality.

MENU Button ‣ ITEM Button x4 ‣ Keypad, Up Arrow to raise, Down Arrow to lower, ENTER Button to save

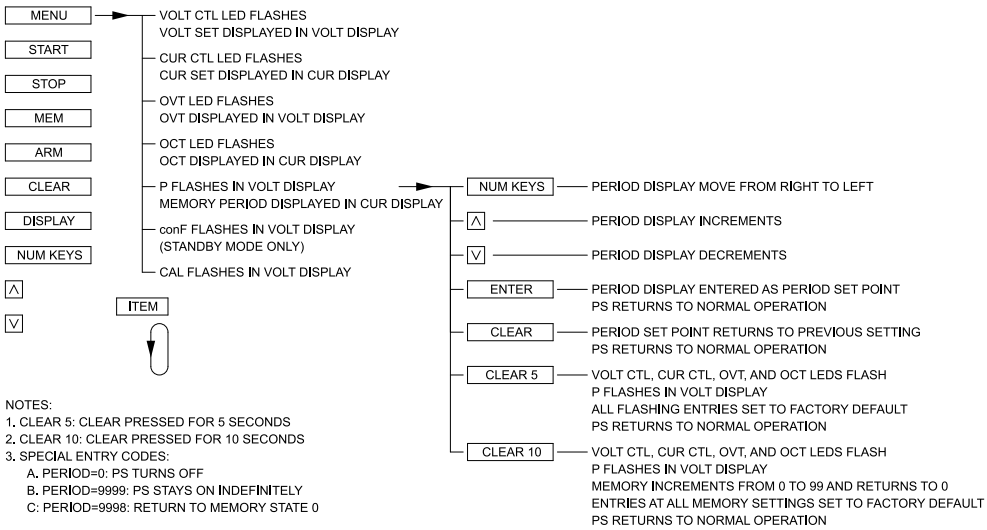

Fig. 6.5 Set the period (PER) from the front panel

6.2. Setting Trip Points

6.2.1. Over Voltage Trip

Program the voltage trip setting used to shut the product off with a fault. The product must be in ROTARY set point source to program over voltage trip from the front panel.

MENU Button ‣ ITEM Button x2 ‣ ENTER Button ‣ Up Arrow to raise, Down Arrow to lower, ENTER Button to save

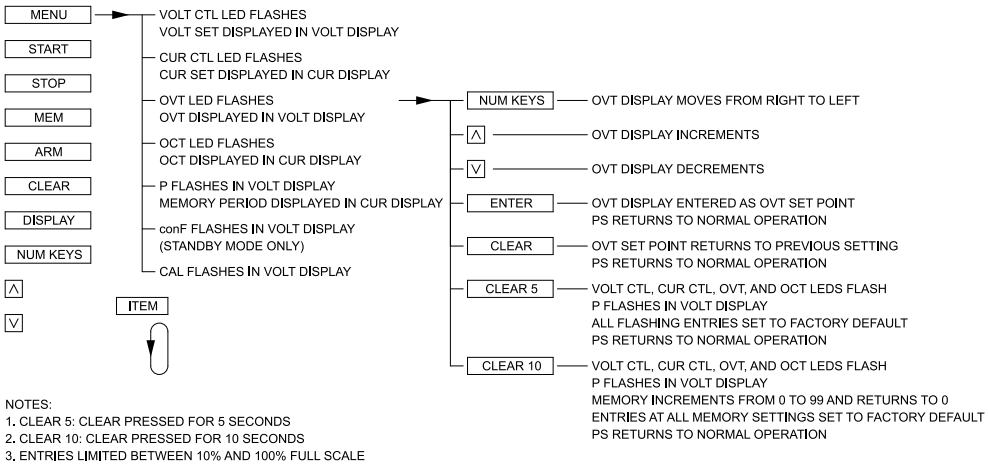

Fig. 6.6 Set the over voltage trip (OVT) from the front panel

6.2.2. Over Current Trip

Program the current trip setting used to shut the product off with a fault. The product must be in ROTARY set point source to program over current trip from the front panel.

MENU Button ‣ ITEM Button x3 ‣ ENTER Button ‣ Up Arrow to raise, Down Arrow to lower, ENTER Button to save

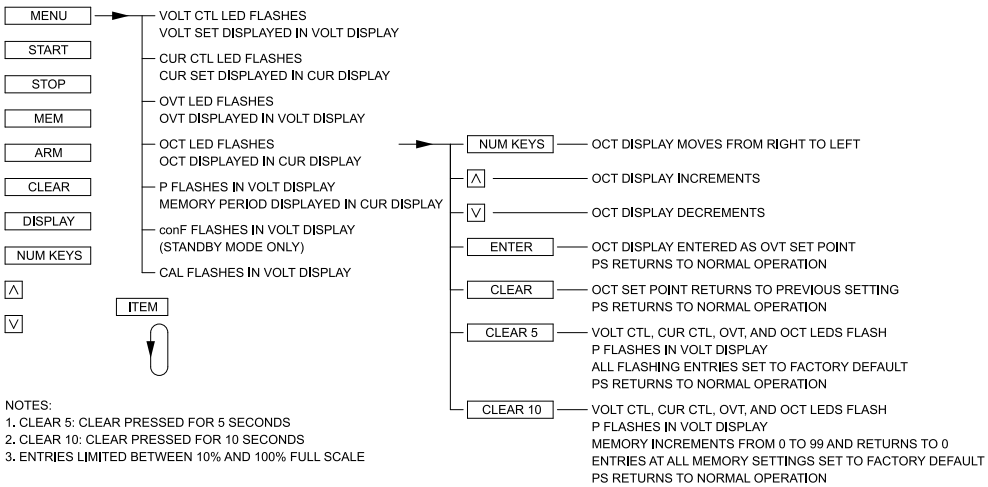

Fig. 6.7 Set the over current trip (OCT) from the front panel

6.3. Configuring Set Point Source

The set point source determines where the TS Series MagnaDC power supply will receive its voltage, current, over voltage trip, and over current trip set points. The instructions below detail how to enable the various set point source configurations. Only one set point source can be enabled at a time.

Note

The product must be in Standby when configuring the set point source.

6.3.1. Rotary (ROTARY)

Set point control from the front panel knobs.

MENU Button ‣ ITEM Button x5 ‣ ENTER Button ‣ ITEM Button x3 ‣ ENTER Button (Enable)

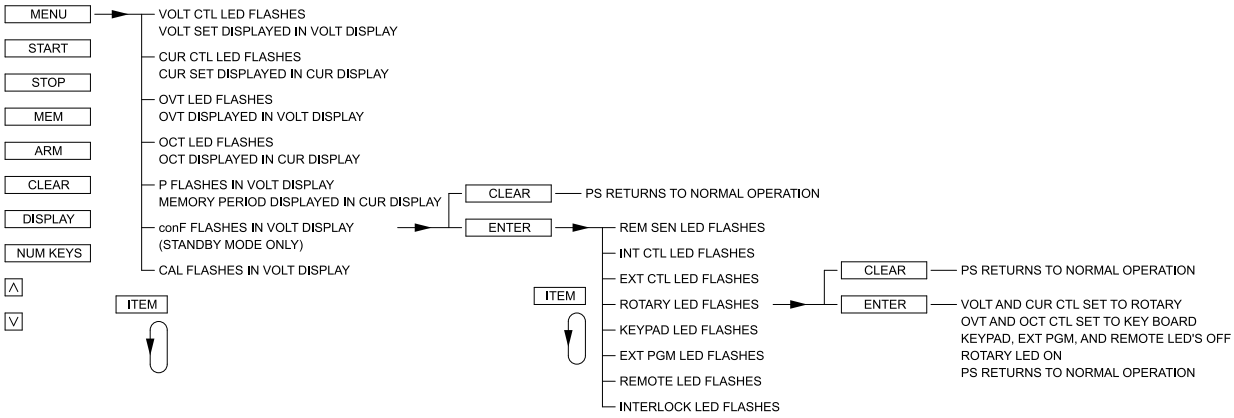

Fig. 6.8 Enable rotary (ROTARY) set point source from the front panel

6.3.2. Keypad (KEYPAD)

Set point control from the front panel 10-digit keypad or through memory auto-sequencing

MENU Button ‣ ITEM Button x5 ‣ ENTER Button ‣ ITEM Button x4 ‣ ENTER Button (Enable)

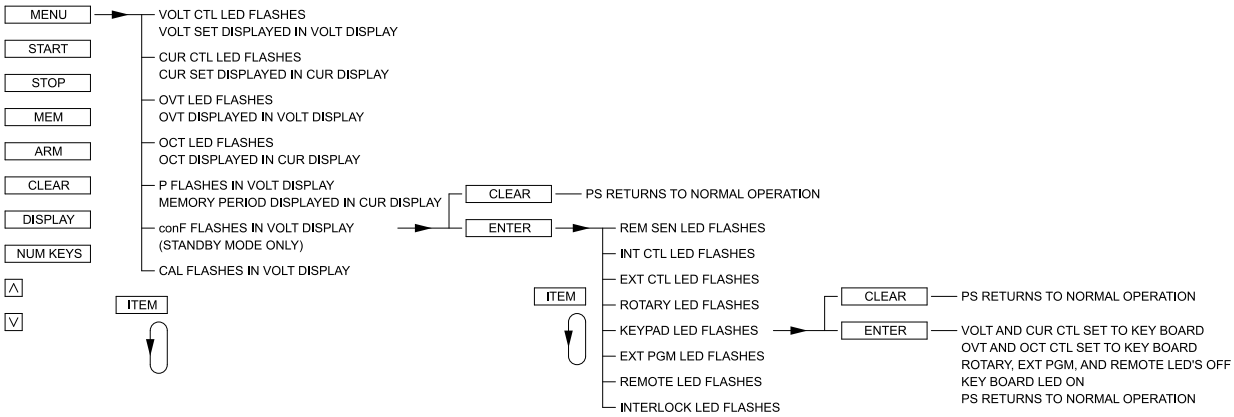

Fig. 6.9 Enable keypad (KEYPAD) set point source from the front panel

6.3.3. External Program (EXT PGM)

Set point control from the 0-10V analog inputs on the JS1 external user I/O connector.

MENU Button ▸ ITEM Button x5 ▸ ENTER Button ▸ ITEM Button x5 ▸ ENTER Button (Enable)

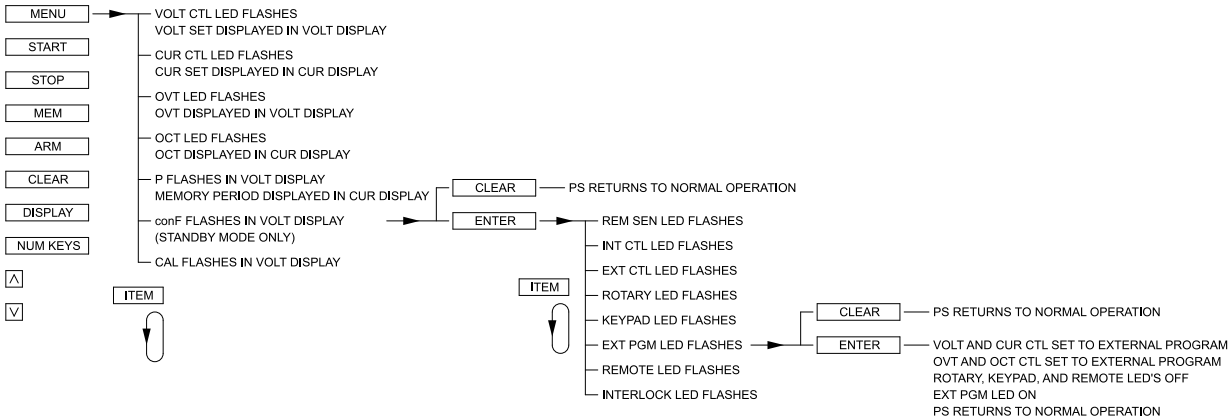

Fig. 6.10 Enable external program (EXT PGM) set point source from the front panel for external user I/O control

6.3.4. Remote (REMOTE)

Set point control from any computer interface.

MENU Button ▸ ITEM Button x5 ▸ ENTER Button ▸ ITEM Button x6 ▸ ENTER Button (Enable)

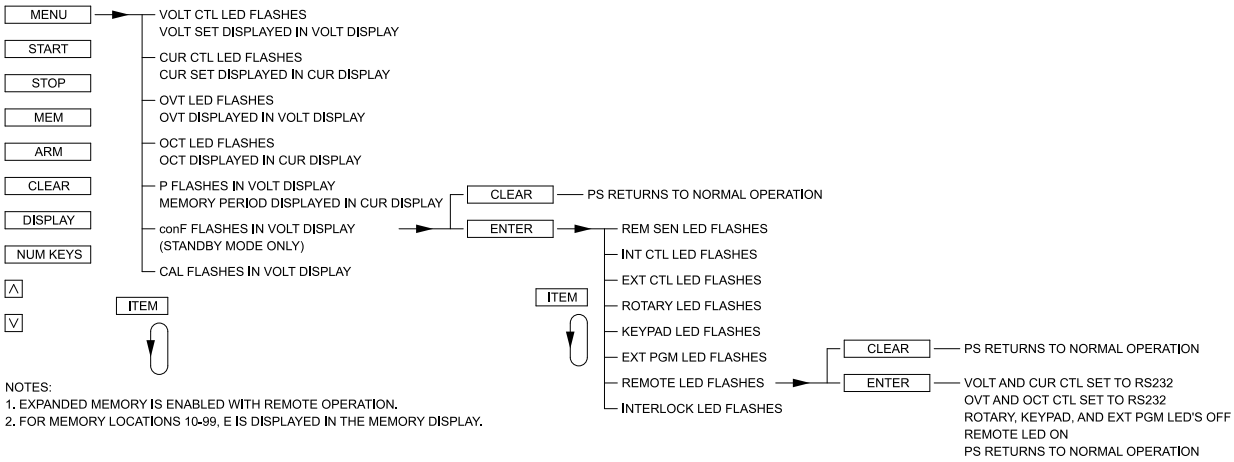

Fig. 6.11 Enable remote (REMOTE) computer programming set point source from the front panel

6.4. Configuring Functionality

6.4.1. Remote Sense (REM SEN)

Set the product to enable or disable voltage sensing from the high impedance remote sense leads, to provide compenstation for voltage drop in the cables.

MENU Button ‣ ITEM Button x5 ‣ ENTER Button ‣ ENTER Button (Enable) or CLEAR Button (Disable)

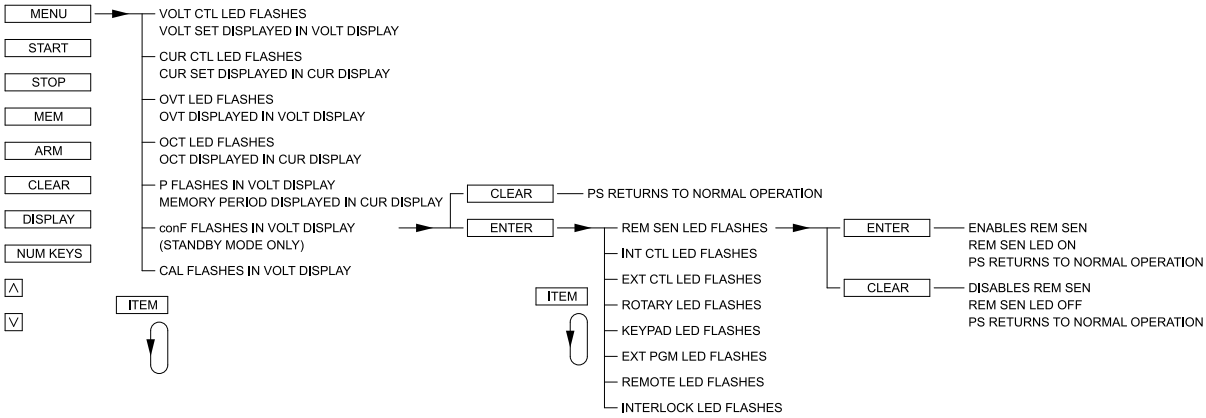

Fig. 6.12 Enable or disable remote sense functionality

6.4.2. Internal Control (INT CTL)

Allows for front panel control of Start, Stop, and Clear functions.

MENU Button ‣ ITEM Button x5 ‣ ENTER Button ‣ ITEM Button x1 ‣ ENTER Button (Enable) or CLEAR Button (Disable)

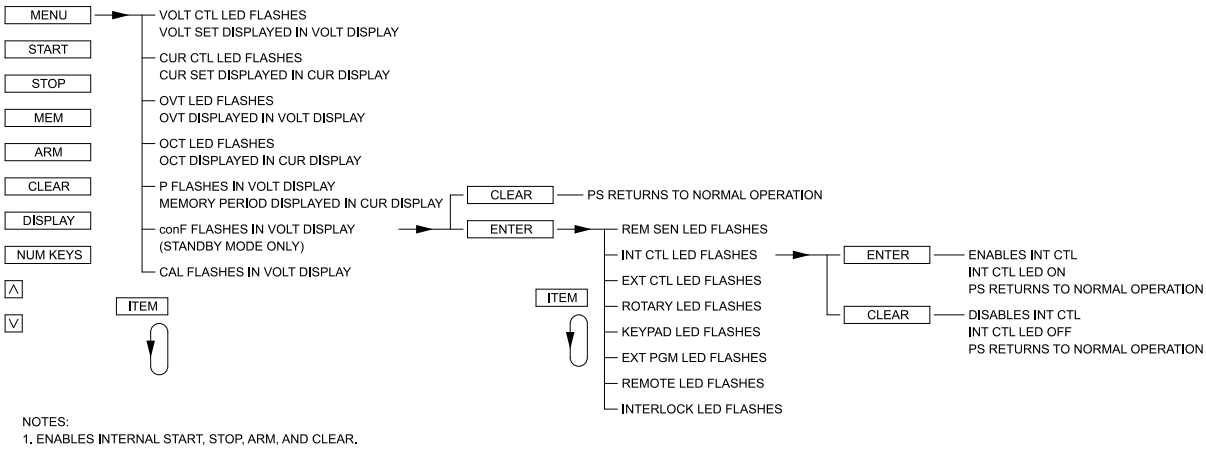

Fig. 6.13 Enable or disable internal control functionality

6.4.3. External Control (EXT CTL)

Allows for JS1 37-pin external user I/O digital input control of Start, Stop, and Clear functions.

MENU Button ‣ ITEM Button x5 ‣ ENTER Button ‣ ITEM Button x2 ‣ ENTER Button (Enable) or CLEAR Button (Disable)

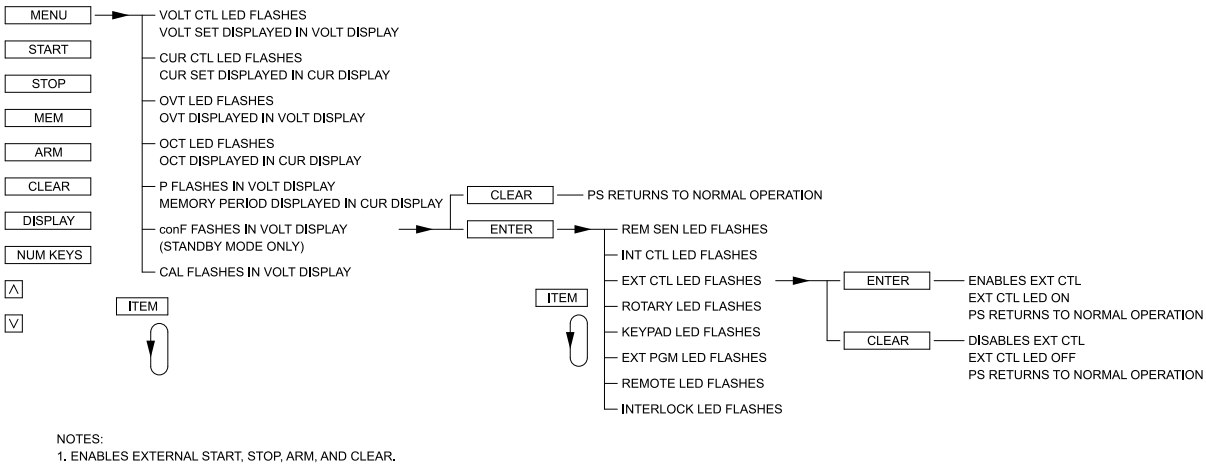

Fig. 6.14 Enable or disable external control functionality

6.4.4. Interlock (LOC)

Enable or disable interlock functionality.

MENU Button ‣ ITEM Button x5 ‣ ENTER Button ‣ ITEM Button x7 ‣ ENTER Button (Enable) or CLEAR Button (Disable)

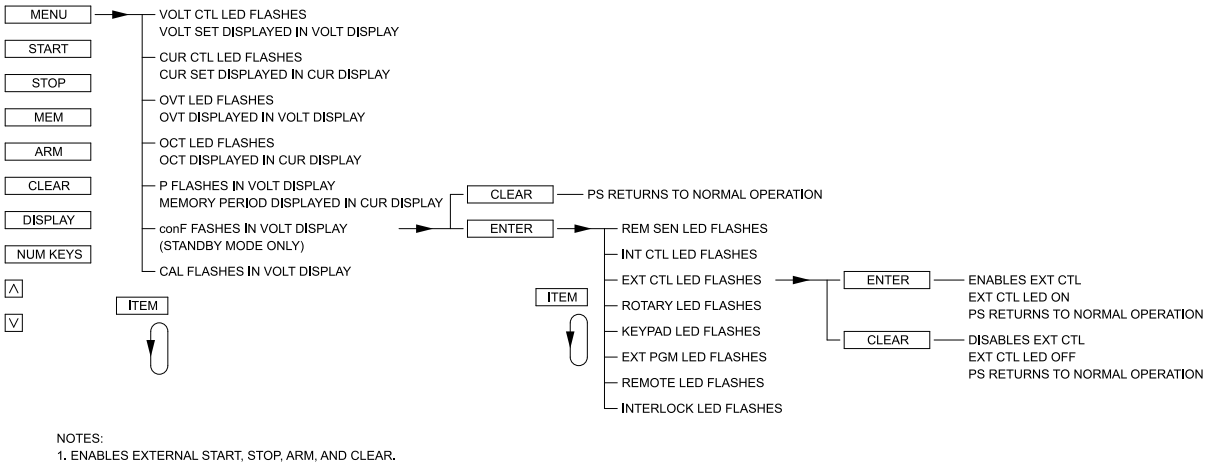

Fig. 6.15 Enable or disable interlock functionality

6.5. Calibration

This section details how to access and change the digital calibration potentiometers from the front panel. For more details on the calibration procedure for the TS Series MagnaDC power supply, refer to Calibration.

Fig. 6.16 illustrates how to utilize the calibration commands using the front panel. Calibration commands allow calibration of five digital potentiometers, display of the firmware and hardware revisions, and reset the digital potentiometers to the factory calibration settings. All of these commands can be made when the power supply is in either the standby or power mode state.

To enter the calibration commands, first press the menu key. The over voltage trip LED will initially flash. Then press the item key 3 times. The voltage display will flash CAL (calibration). Press enter for 10 seconds or press clear to exit the calibration command menu. Upon entering the calibration commands, the output voltage will be displayed in the voltage display, the potentiometer setting, 0 to 255, will be displayed in the right three digits of the current display, and P and 1 will alternately flash in the left digit of the current display. Potentiometer 1 adjusts the gain of the voltage feedback amplifier, potentiometer 2 adjusts the input offset voltage of the voltage feedback amplifier, potentiometer 3 adjusts the gain of the current feedback amplifier, potentiometer 4 adjusts the input offset voltage of the current feedback amplifier, and potentiometer 5 adjusts the gain of the reference which is used for the digital to analog and analog to digital converters.

Pressing the item key advances control to potentiometer 2. The left digit of the current display will alternately flash P and 2, the output voltage will be displayed in the voltage display, and the potentiometer setting, 0 to 255, will be displayed in the right three digits of the current display.

Pressing the item key again will advance the control to potentiometer 3. Now the output current will be displayed in the current display, the potentiometer setting, 0 to 255, will be displayed in the right three digits of the voltage display, and the left digit of the voltage display will alternately flash P and 3.

Press the item key again will advance to control potentiometer 4. The left digit of the voltage display will alternately flash P and 4, the output current will be displayed in the current display, and potentiometer, 0 to 255, will be displayed in the right three digits of the voltage display.

To advance adjustment to potentiometer 5, press the item key again. The left digit of the current display will alternately flash P and 5, the output voltage will be displayed in the voltage display, and the potentiometer setting, 0 to 255, will be displayed in the right three digits of the current display.

Once a digital potentiometer has been selected for adjustment, pressing the up/down keys increments or decrements the potentiometer setting, respectively. To save the new setting, press the enter key or press the clear key to exit the routine. Instructions for the calibration procedure are discussed in Calibration.

After selecting digital potentiometer 5, pressing the item key displays the firmware revision in the voltage display and the hardware revision in the current display. Pressing the item key again displays dEF (default) in the voltage display. Pressing the enter key resets the five digital potentiometers to the factory default settings.

To exit the calibration menu, press the item key until rEt (return) appears in the voltage display. Press the enter key to exit the calibration menu.

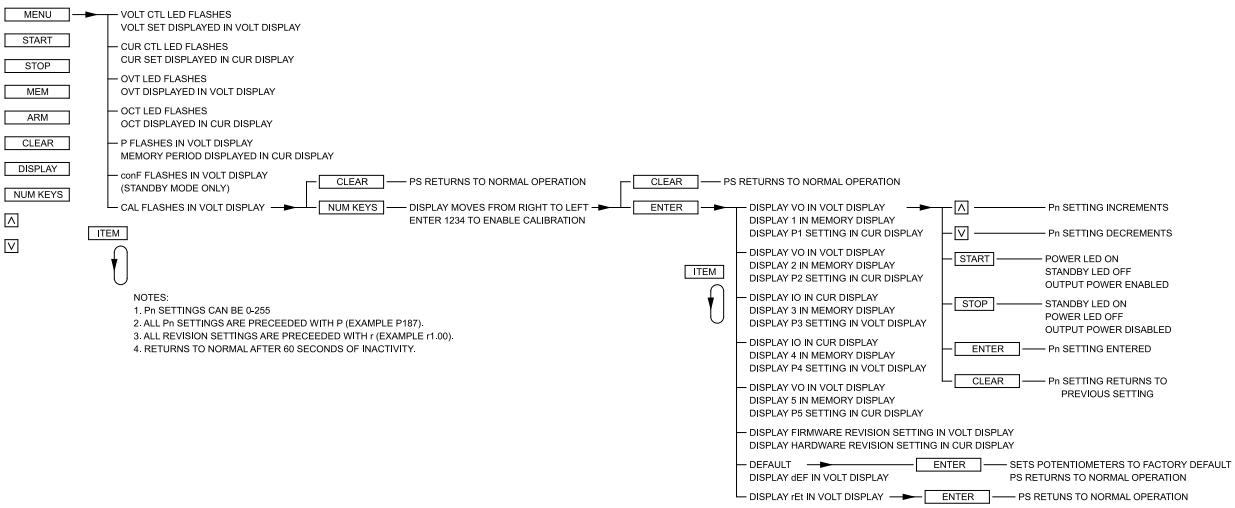

Fig. 6.16 Front panel calibration menu